AVICULTURAL MAGAZINE

VOLUME 106
No. 2
2000

THE AVICULTURAL SOCIETY

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AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

Vol. 106 - No. 2 ISSN 0005 2256 2000

ECUADORIAN BIRDS: NESTING RECORDS AND EGG DESCRIPTIONS FROM A LOWLAND RAINFOREST

by Ryan L. Hill and Harold F. Greeney

Despite its small size, Ecuador is a strikingly biologically diverse country. It boasts at least 1,600 species of birds, most which are seriously threatened by habitat destruction. As is often stated, tropical forests are being destroyed at an ever increasing rate. In light of this fact, ecological data of all kinds must be made available in the general literature so that conservation minded individuals have access to it. Birds are particularly amenable to conservation applications because of their relative ease of detection and popularity with birdwatchers and nature enthusiasts. It is with these thoughts that we present the following observations.

The nest records below were all observed in the vicinity of La Selva Jungle Lodge in the Provincia Sucumbios near the town of Anyangu. The lodge is located approximately 75 km (about 46 miles) downstream from the town of Coca along the Rio Napo at an elevation of approximately 250m (about 820ft). The habitat in this area, typical of upper Amazonia, is a complex mix of *terra firme*, *varzea* (flooded forest) and meandering oxbow lakes. Over 500 species of birds have been recorded from this site, which give it one of the most diverse avifaunas in the world.

Zigzag Heron *Zebrilus undulatus*

Observed March 23rd and 24th, 1998. An adult and one chick were located on a platform-type nest composed of spiny palm leaflets and petioles. The nest was encountered because either the adult or chick was vocalizing, and alerted us to its position. The call was different than that normally heard from this species. The normal call is a two noted, throaty 'enng-nah' that is slurred together (Moore, 1993 and pers. obs.). The call was higher pitched than that normally heard. It consisted of a medium pitched 'ehmp' repeated every second for two or three seconds followed by a pause before it was heard again. Because of the high pitch we believe it to have been made by the chick. Only the adult was visible from its perch on the nest,

which was hidden among many 'chontilla' palms *Bactris* sp. These palms are heavily armed with long sharp spines so the nest was well protected. The nest was within 2m (approx. 6ft) of a narrow backwater channel connecting an oxbow lake to the main river. At the time, the area was well flooded so that the area under the nest was inundated with water approximately 1m (about 3ft) deep. The nest was 1.5m (about 5ft) above the water.

While observers remained at a distance, the adult remained frozen in a hunched-neck, cryptic posture. When we approached to take photographs the adult stretched its neck with its beak pointed up in a defence posture. At this time the chick became visible. It seems apparent that the adult was hiding the chick because the chick was pure white and obvious once the adult moved. The pair remained perfectly still and no more vocalizations were heard.

On June 8th, 1998 an adult and immature were observed flying together in *varzea* forest along the outlet to an oxbow lake. The pair flew in front of us and landed in relatively plain sight less than lm (3ft 3in) above the water. The immature then flew directly at the adult, came very near to striking it and then returned to nearly the same perch. The adult moved a short distance deeper into the forest, perched, and then retreated into the forest beyond our view.

White-eared Jacamar *Galbalcyrhynchus leucotis*

Two adults were observed April 26th, 1998, emerging from and entering a large termitary located approximately 8m (26ft) up in a dead tree. The tree was located in a man-made clearing adjacent to the Napo River. The surrounding area was mostly coffee plantation adjacent to large tracts of primary forest. No food was observed being brought to the nest, and it is unknown if there were young present at the time.

Black-tailed Tityra *Tityra cayana*

March, 1998, two adults were observed entering and exiting a hole in a tree *Cecropis* sp. adjacent to an oxbow lake. The nest hole was approximately 9m (30ft) from the ground. The adults were observed in the late afternoon and evening. The area had several similar trees with holes that appeared suitable for nesting.

Black-fronted Nunbird *Monasa nigifrons*

A nest was discovered April, 1998, in the side of a gentle hill on the edge of a large oxbow lake. The hole was over lm (3ft 3in) deep, and no observations of the nest itself could be made. Adults regularly perched for hours at a time in nearby foliage.

White-fronted Nunbird Monasa morphoeus

Two adults were observed April, 1998, excavating a hole in flat ground within lm (3ft 3in) of a well used trail in primary forest. The nest was soon abandoned. It seems likely this was because of human traffic.

Ocellated Poorwill *Nyctiphrynus ocellatus*

Observed on December 18th and 22nd, 1997, between 9.00am and 10.00am. The nest was found on the side of a steep ridge (with an approx. 35-40 degree slope) in primary forest. It was located within 4m (approx. 13ft vertically) of the top of the ridge of a north facing slope. The nest consisted of a loose assemblage of dead leaves. The nest's downhill portion had several leaves arranged into a raised edge to create a flattened area and served to camouflage the adult from below.

The lateral portions of the nest also consisted of leaves arranged so that overall it resembled a shallow dish. Under and around the eggs, the leaves were flattened down, which made them distinguishable from the surrounding non-nest leaves. However, without the clues of an adult or egg, the nest was barely discernable from the surrounding leaf litter. There was a single egg in the nest. This was pale tan with a slight hint of orange. The egg was sparsely blotched with darker tan at its thickest part. The egg was estimated to measure 32mm x 19mm.

The nest was less than 0.5m (2ft) from an infrequently used trail and was discovered when the adult flew off the nest as we passed. Had the adult remained motionless, it is doubtful it would have been detected due to its incredible camouflage when sitting in the leaf litter. The adult flew approximately 5m (about 16ft) away, landed the ground, and then moved to a horizontal liana 3m (almost 10ft) farther away. During the second visit to the nest, the adult stayed on the nest while we observed from only 3m (almost 10ft) away. Its eyes were open and it remained quiet and still. R. Hill approached within 0.5m (not quite 2ft), and it did not move until an insect net was brought closer still. It then flew off.

Black-spotted Bare-eye *Phlegopsis nigromaculata*

This nest, observed April 22nd and 23rd, 1998, was found in primary forest near the river's floodplain, but in an area that rarely floods. The surrounding area was flat and contained many palms and large kapok *Ceiba* sp. and fig trees *Ficus* sp. The most numerous trees in the area, however, were the Stilt-root Palm *Iriartea deltoidea*. The undergrowth was not overly dense in this area, and allowed us to pass with relative ease. Nearby (within 100m (320ft)) was a moderately sized ravine.

The nest itself was found in the stump of a Stilt-root Palm approximately lm (3ft 3in) from the ground. The stump had rotted such that its centre

formed a cup-like cavity. The nest consisted of a bowl-shaped mat of palm leaflets and thin vines. There was a young fern growing out of the palm that partially shaded the nest. The trunk had rotted away in such a fashion that it left an opening on one side. The adult sat on the nest in a position to see potential predators through this opening.

Two eggs were found in the nest. They were pale pink with dense, wavy, mauve lines. One egg was removed and measured 26mm x 19mm. When the nest was first encountered, we had approached from the side with the opening and the adult detected us and fled. It landed 10m (just over 30ft) away and allowed for proper identification. As we moved to get a closer look it fled again. The next day, when we approached from the opposite side the adult stayed on the nest until an attempt to photograph it from less than 1m (3ft 3in) was made. It promptly fled when we were detected. In both instances it flew rapidly and no vocalizations were heard.

White-winged Swallow *Tachycineta albiventer*

A nest was found in May, 1998 inside the bamboo hand railing of a boardwalk that served as a dock. The nest was 5m (approx. 16ft) away from shore out over the water on an oxbow lake. The nest was located in a piece of bamboo that had a small hole in the end that was approximately 6cm-7cm (approx. 2¼in-2¾in) in diameter. It consisted of pieces of vegetation such as grasses and possibly thin palm leaflets formed into a rough platform. Another nest was observed in late September 1997. This nest was located in the semi-hollowed out end of a fallen tree that was sticking out of an oxbow lake. This nest was approximately 3m-4m (approx. 10ft-13ft) from the bank. There were eggs in it at the time. The eggs were observed being eaten by a Cuvier's Toucan *Ramphastos cuvieri* as the adult swallows dive bombed it in obvious protest.

Black Vulture *Coragyps atratus*

Two young were discovered on June 27th, 1998 in a protected area that was made by the buttressed roots of a Kapok tree *Ceiba* sp. Two large roots growing out from the tree formed the sides, which were approximately 3m (about 10ft) tall and a secondary root off of one of the large roots grew between the two creating an enclosure. This enclosure seemed impenetrable to all but the most agile of terrestrial predators. The lowest part of the protected enclosure was 1.5m (almost 5ft) tall where the secondary root contacted the other large root. The ground area contained by the roots was perhaps 1.5m (almost 5ft) square.

The tree was located in *terra firme* primary forest. The adult was guarding the nest from a nearby perch approximately 5m (approx. 16ft) off the ground and made a rasping breathy, hiss-like warning call when we approached.

The young began hissing as well. The adult then swooped down over our heads and perched 3m (about 10ft) above us. The adult hissed again and then remained quiet. The young continued hissing when we looked down upon them.

Habitat preservation is critical to the process of saving our planet's wild areas. Yet correct choices cannot be made without knowledge of the ecology and behaviour of the world's fauna. We hope this, and other natural history papers, do not end up as nothing more that epitaphs, but instead serve as valuable resources for generations of scientists to come.

Acknowledgements

We would like to thank the staff and administration of La Selva Jungle Lodge for their hard work and continual support without which our field work would remain tiresome and mundane. R. Hill would like to give special thanks to Bernard and Darlene Hill for their continued support and interest in his studies. H. Greeney would like to thank Robert and Katt Azar for their encouragement and support of his interest in natural history. This work is dedicated to the memory of Robert Yonally, whose passion for birds made a difference.

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WATCHING BALI STARLINGS AT JERSEY ZOO

by Tracé Williams

The recent raid on the captive-breeding centre at Bali Barat National Park (see News & Views, Vol. 106, No.1, p. 44), in which many of the adult Bali Starling *Leucopsar rothschildi* breeding stock were stolen, has highlighted the desperate situation that this species faces in the wild. Time is running out for the national bird of Bali, making maintenance of the captive population elsewhere even more important.

I began studying the Bali Starling at Jersey Zoo, headquarters of the Durrell Wildlife Conservation Trust, at the start of the 1998 breeding season. Successful breeding of this species had been varied across all holding institutions, with no real solutions to why some years were better than others or why some parent birds seemed unable to successfully rear their young. Jersey Zoo decided to investigate their variability through the innovative use of small cameras placed inside specially adapted nest-boxes, linked to monitors and video cameras, enabling all activity to be observed. In that year I was able to observe egg laying and incubation for 16 clutches from six different pairs and to quantify details of both parent and chick behaviour for seven broods.

The results of my investigation supported continuing improvements in husbandry made by the Bird Department and, along with nutritional studies being carried out, enabled positive changes to be made concerning variety and nutritional content of the diet, timing and availability of food supplies and encouragement of the chicks immune system through medicated food; the bulk of their insect diet itself being maintained on a nutritionally balanced diet. As with all changes in husbandry, immediate results were not expected, however, in the following breeding season there was an encouraging slight increase in the survival of parent reared chicks.

Close observation of the breeding ecology of Bali Starlings from hours of video watching gave me insight into activity not usually seen. I was intrigued by many aspects of their behaviour, especially concerning the hatching process, and began study for a masters degree in spring 1999, through the Durrell Institute of Conservation and Ecology, University of Kent, at Canterbury. I decided it would be also interesting to study the hatching process of another sturnid, the Common Starling *Sturnus vulgaris*, for comparison with another member of the Sturnidae family.

In 1999, using the same methods and equipment, three pairs of Bali Starlings were studied and I was able to record on video nine different hatching events. One nest-box was made available to Common Starlings which provided four hatching events. I investigated behaviour of both parent

birds for a fixed period prior to each egg hatching, calculating the actual duration of hatching (visible externally only), and observing behaviour of parents and chicks, one hour post-hatch.

Another interesting aspect of the investigation are the eggshells. With help from the bird keeping staff, I collected eggshells from the Bali Starlings, which most of the birds kindly deposited at the front of the aviary ready for collection. Eggshell thickness is measured using a micrometer, the length and breadth of both halves of the eggshell are also measured and using a binocular microscope in the Veterinary Department, Jersey Zoo, I am looking for signs of use of the chick's egg tooth. Although retreating soon after hatching it is not known when the so-called 'hatching-muscle' *Musculus complexus* or the egg-tooth of a Bali Starling chick disappears, so I am also examining any very young chicks (<6 days) that do not survive and documenting the detection of either.

At the beginning of March 2000, a further two nest-boxes were erected for Common Starlings, all of which have cameras linked to monitors and video recorders. Only one nest-box was opened initially, in an effort to stagger the hatching events from different pairs. The other two boxes will be opened in sequence as soon as a good nest is completed in the first. The Bali Starling breeding season begins at the end of April. It is anticipated that five pairs will be selected for breeding this year, some being different birds to last year enabling me to increase the sample size and data collected.

The exceptional plumage and vocabulary of the Bali Starling has, unfortunately, been its downfall. While the political unrest continues in Indonesia, the possibility of further reintroductions are minimal, as is the likelihood of survival for the remaining few wild birds. The importance of continued research to support best husbandry practices for this species in the captive situation cannot therefore be underestimated. This project will I hope give us more clues as to how we can help to conserve the Bali Starling and in this way, hopefully, we can ensure that the Bali Starling does not become another Dodo.

This project is currently being supported by: Jersey Zoo, John Ray Trust, British Ornithologists' Union, the International Fund for Avian Research, the Eric Hosking Charitable Trust, Bali Mynah Species Survival Plan, USA and the Avicultural Society.

The Durrell Wildlife Conservation Trust operates species recovery programmes for some of the world's most endangered animals at its Jersey Zoo headquarters and through projects in-country. You can help save animals from extinction by supporting the Durrell Wildlife Conservation Trust, Les Augrès Manor, Trinity, Jersey, Channel Islands JE3 5BP.

THE UNIQUE FISHING TECHNIQUES AND NEST BUILDING BEHAVIOUR OF CAPTIVE HAMMERKOPS *Scopus umbretta*

by Greg Bockheim

The African aviary and its inhabitants

At Disney's Animal Kingdom (DAK) the pair of Hammerkops *Scopus umbretta* is housed in a large free-flight aviary. The aviary covers an area 50m long x 20m wide x 19m high (approx.164ft long x 65ft wide x 62ft high) with a densely planted understory which includes mature trees that create a nearly unbroken canopy overhead. A two-storey waterfall pours into pools at two different levels intentionally flooding areas which become 'tidal zones'. A path meanders through the centre of the aviary allowing guests (as we call visitors to DAK) a close encounter with over 140 individual specimens of 28 avian species.

Aquatic birds in the aviary include African Jaçanas *Actophilornis africanus*, Pygmy Geese *Nettapus auritus*, White-backed Ducks *Thalassornis leuconotus*, Black Crakes *Amaurornis flavirostris* and Hottentot Teal *Sarcelle hottentote*. The more arboreal species that the Hammerkops may have occasional or frequent contact with include Hadada Ibis *Hagedashia hagedash brevirostris*, Superb Starlings *Spreo superbus*, Golden-breasted Starlings *Cosmopsarus regius*, Olive Pigeons *Columba arquatrix*, African Grey Parrots *Psittacus erthacus*, Ross's Touracos *Musophaga rossae* and Long-tailed Magpie Shrikes *Corvinella melanoleuca*. Fish in the African aviary pools include Tilapia *Oreochromis variabilis*, two species often referred to as 'spiny eels' - Bichir *Polypterus ornatipinnis* and Zaire Eel *Afromastacembelus frenatus*, four mid-size ciclid species from Lake Malawi, and the live-bearing Florida native species referred to as Mosquito Fish *Gambuisa* sp. All of the fish species, except the 'spiny eels' reproduce and provide a continuous supply of live fish in the aviary pools. The fish inhabit all the pool zones from the very shallow water of the planters (2cm-12cm ($^3/_4$in-4$^3/_4$in) in depth), preferred by the *Gambuisa* and ciclid fry, to the larger pool areas (up to lm (3ft 3in) in depth). In these deeper pool areas we see the fish species divide into well defined zones with the small *Gambuisa* schooling at the surface, and the colourful ciclid species staying close to the rocky bottom.

DAK's two Hammerkops, both captive reared, were acquired from two separate zoological institutions in October 1997. In February 1998 they were introduced to their new habitat following a quarantine period and then an introductory protocol which involved placing the birds in a 'howdy' cage on the second floor of the aviary habitat. When released the birds did not

initially seem to favour any particular area of the aviary and seemed to enjoy the upper canopy as well as the water features. Competition between the bird species remains minimal, likely due to the large size of the aviary, dense foliage, the diverse species, the bird's gradual introduction to the habitat and individual species' populations. The arrangement and quantity of feeding stations also seems to reduce aggressive interactions between species.

Fishing techniques

The Hammerkops have demonstrated some unusual fishing practises. Some techniques observed at DAK have been reported in other avian collections, or in the wild, but another technique has not been reported in the professional literature reviewed. After the hammerkops had been in the aviary for six months they were observed presumably searching for fish using the species-typical means of searching for livefood in wet marshy areas. This fishing style was best described by M. P. Kahl.

'Stirring with the feet is a common technique used by Hammerkops to fish for prey. The foot is placed in the normal standing position; then it is shuffled rapidly four to five times while being brought forward to a position under the bill. The foot is then placed down in this forward position and the process repeated with the other foot. Meanwhile the bird peers intently at the water. Such movements are likely to drive concealed prey into sight. Occasionally a bird was seen to open both wings partially for an instant while foot-stirring. Presumably this 'wing-flashing' technique also served to startle prey into action so that it could be more easily seen' (Cowles, 1930).

Our birds also employ another form of fishing that has been observed to occur among birds in the wild. On these occasions the birds fly slowly, using deep wing beats, low over the water. The legs dangle, brushing the surface, as the bird peers down into the water. When approaching potential prey, the bird hovers momentarily, dips its beak into the water and grabs the prey. Our Hammerkops are frequently successful using this technique. We often observe our Hammerkops using the same technique, but without hovering, and instead simply flying directly across the surface of the pool dipping their beaks in and catching fish that they had presumably seen from the shore or because the *Gabusia* schools are so concentrated at the surface that the birds are often guaranteed to catch one without having seen it first. The distance across the pools varies from 2m-7m (approx. 6ft 7in-22ft 7in) and the birds have been seen covering these distances when fishing. On occasions our birds also fly across the pools lightly dragging their toes across the surface of the water while not appearing to be searching for fish. We have surmised that the birds are attracting fish to the surface of the water so that they might be captured the next time they fly over.

Foot stirring appears to be our Hammerkops' most popular means of pursuing livefood. Probing for it with their beaks is also popular but not nearly as commonly seen. Like those Hammerkops observed in the wild (Cowles, 1930), our birds also wash all of the prey caught in the water before swallowing it. They do not, however, take insects caught on dry land to the water to wash before eating them. After they have caught a medium to large fish that is more difficult to swallow, the birds may take up to 25 minutes to repeatedly attempt to swallow it, regurgitating it again even after only its tail is sticking out of the beak. Our birds have also captured Tilapia, much too large for them to swallow, and have deserted the carcass. The Hammerkops have also been observed perched at the water's edge and then running swiftly through shallow water (2cm-7cm (3/4in-2 3/4in) deep) to jab at small Mosquito Fish or Tilapia fry hiding in the shelter of fallen leaves or other such deadfall. They have also been observed to approach quickly and freeze near a leaf or other particle that falls on the water and floats, in apparent anticipation of a fish coming to feed off the fallen item or to seek shelter beneath it.

An unusual fishing technique

It is in feeding the following diet that we have observed our Hammerkops using an unusual fish 'baiting' or fish capturing method. Our Hammerkops are fed a staple diet twice daily that is equal parts soaked Mazuri flamingo complete and Milikin Meats 'carnivore meat'. The ingredients are kneaded together and rolled into balls roughly 3cm (1 1/4in) in diameter. Our birds take these balls of food and fly to the water's edge with them. Upon arrival at the water's edge, they most often drop the ball of food on the shore or at the water's edge. They then shake it into pieces with their beak; this shaking behaviour scatters pieces of the mixture into the water and this attracts fish. The birds then repeatedly pick up a chunk of food, breaking smaller pieces from it which float into deeper water. A feeding frenzy ensues with the fish not only struggling to get the food particles which have landed in the water but also almost throwing themselves onto the shore or into the shallow water at the Hammerkops' feet. The Hammerkops then simply choose which size fish seem most desirable and pick them up. On many occasions the birds have pecked at and pulled from the water very large fish up to 20cm (8in) long (nearly a third of their own length) and dropped them back into the water. When 'baiting' and then choosing a fish, the birds most often select small Tilapia and the smaller colourful ciclids.

Nest building

Our pair began to build in April 1998 when they were both 11 months of age. During their early nest building attempts the birds brought tree branches, twigs and leaf matter to three different locations in the aviary. Within the

first five days of what might be referred to as frenzied nest building the pair settled on a light platform site 8m (just over 26ft) above the largest aviary pool. During this first attempt the nest under construction was frequently visited by the pair of Hadada Ibis which would alight on the mass of sticks and scavenge for material for their own nest. During these visits the pair of Hammerkops did not defend the nest but instead perched nearby. Later, when nearing completion of this first nest, a pair of Superb Starlings scolded and chased off the Hammerkops, took over the nest and eventually reared young. The Hammerkops did not retaliate other than utter their high pitched screams when being chased by the starlings. In June 1998 the pair of Hammerkops began their second nesting attempt in the fork of a Tepu Tree *Tipuana tipu* 3m (almost 10ft) above the path. In mid-July the pair had two eggs (later found to be infertile). By the end of July one of the eggs was found broken beneath the nest and the other had disappeared. No significant disturbances were recorded at this nest site although snakes were frequently captured in the aviary during this season. Through the early part of August 1998 the pair were frequently observed aggressively chasing each other and fighting. The male often was the aggressor and appeared to be pushing the female in the direction of the unsuccessful nest in the Tepu Tree. After a couple of weeks the pair settled and chose to repair and continue nest construction at the original site on the light platform but frequently visited the nest in the Tepu Tree. A third nest site on another light platform, also 8m (approx. 26ft) from the ground was also begun during this time. The pair soon settled though on the most recent light platform and began dismantling the nest in the Tepu Tree and bringing nest material to this platform. Within four weeks the pair had completed this nest, having dismantled the old nest in the tree, and abandoned the nest on the first platform. Being far out of reach this new nest site was impossible for the keeper to check and on February 18th, 1999 a fully developed chick could be seen peering out of the nest. Within a week three chicks had left the nest. From the beginning these newly fledged Hammerkops were accomplished fliers and manoeuvred well when flying in the aviary. Within the week, however, it was discovered that the two younger chicks were not thriving as well as the first chick. Following examination by our veterinary staff it was determined that the younger chicks had suffered nutritional deficiencies which were corrected after six weeks of nutritional therapy and hospitalization.

Reproduction summary

The two birds which make up our founder pair of Hammerkops were hatched at different zoological institutions on April 27th and 28th, 1997. They were acquired by DAK when they were eight months of age. After a quarantine period and four weeks of introduction to each other and their

new habitat they began nest building at 11 months of age. This nest building behaviour began after only six weeks of living in their new habitat. They built four successive nests over a 14-month period and laid their first clutch of eggs, which were infertile, at 18 months of age. The pair hatched and successfully reared young when they were 21 months old in the fourth nest constructed. This fourth nesting attempt was also interfered with by the Superb Starlings, which built their own nest in the side of the Hammerkop nest on the opposite side of the nest entrance. (During this fourth nesting attempt the flock of Superb Starlings comprised females only and it may be that the aggressiveness of the starlings was reduced due to the absence of males). The pair of Hammerkops actively participated in building up to three nests at a time and dismantled a previous nest and used the detritus to construct another nest.

Each of the four nests were built at different locations in the aviary at heights varying from 3m-8m (approx. 10ft-26ft) from the ground (8m (approx. 26ft) is mid-canopy height in our aviary). Only one nest was built directly over water, the others were all within 16m (approx. 52ft) of the largest pool. Two nests were built on platforms (45cm (17 3/4in) wide around 18cm (7in) aviary pole supports) covering the lights in the aviary and the other two were built in forks of medium-sized trees (24cm (9 1/2in) in diameter). All the nests were in clear view of everyone and provided a terrific experience for observers. More often than not guests (or visitors) had to duck their heads when the Hammerkops made the endless trips to and from the nest under construction. Nest construction was continuous throughout the season and nest completion (when the nest roof was in place and the integrity of the nest appeared to be such that eggs may be laid inside) took from 21-40 days. Nest size and shape remained uniform and averaged 1.5m-2m (almost 5ft-6ft 7in) in width and height, with the narrow entrance hole facing different directions at each site. Our Hammerkops were not observed to aggressively disturb other aviary inhabitants but were themselves the focus of other bird's aggression when they ventured too close to nests. The most intense bouts of aggression from the Hammerkops were conspecific but were not a cause for alarm. In order to control the number of chicks hatched, the latest Hammerkop clutch has been replaced with wooden dummy eggs which the birds have accepted and continue to incubate. On five occasions the Hadada Ibis and Superb Starlings were observed removing nesting material from the top and sides of the Hammerkop nests. These intrusions did not cause either Hammerkop to defend their nests, for by nature they seem passive.

An interesting observation was mentioned by the African nationals working at DAK. These staff members, acting as guest informational hosts in the aviary, warned us to stay clear of Hammerkop nests because of the

insects that inhabit them. The literature cited (Cowles, 1930) describes how beetles, cockroaches, millipedes and other arthropods inhabit the nests, attracted to them by the abundant food supply originating either directly or indirectly from the filthy nesting habits of the Hammerkops. Upon dismantling one of our Hammerkop nests we did not encounter an excess of insects nor filthy conditions, both a possible result of the clean captive conditions.

Since raising their chicks our pair of Hammerkops have gone on to build another nest in a Tepu Tree. The breeding pair's remaining juvenile, five months old at the time of writing, lives in the aviary with the parents and has not been seen to aid or interfere with its parents' present attempts at nesting. No aggression has been recorded between the adults and the juvenile, whose sex remains unknown at this time.

Reviewing the reproductive data collected at DAK and having accurate historical records of our original pair of Hammerkops has given us the opportunity to determine the age at which captive Hammerkops may begin to build their nests, lay eggs and successfully rear young, information not available in the sources cited.

Acknowledgements

This paper was made possible due to the diligent behavioural observations recorded by the aviary team at Disney's Animal Kingdom.

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Greg Bockheim, who with Shannon Mezzell won the D.H.S. Risdon Award for the account of breeding the Black Crake Amaurornis flavirostris at DAK (Avicultural Magazine 105,1:12-21), is a member of the Bird Department team at Disney's Animal Kingdom, P.O. Box 10,000, Lake Buena Vista, Florida 32830-1000, USA. Tel:407-938-6383/Fax:502-333-3966. Susan Congdon and Bill Zima, who describe the breeding of the African Jaçana Actophilornis africanus at DAK (pp. 62-74), are members of the same team.

BREEDING THE AFRICAN JAÇANA *Actophilornis africanus* AT DISNEY'S ANIMAL KINGDOM

by Susan Congdon and Bill Zima

Introduction

The African Jaçana *Actophilornis africanus*, with its striking blue frontal shield and long toes which allow it to walk easily across lily-pads, is a fascinating bird to display. It is also of great interest from the natural history point of view on account of its unusual mating behaviour. One female may mate with up to 10 different males in a season (Tarboton, 1995), identifying this species as being polyandrous. Polyandry has been documented in fewer than 50 avian taxa. The greatest challenge in keeping African Jaçanas is breeding and rearing the young successfully. Few collections have had luck hand raising jaçana chicks and even fewer have had the parents raise them successfully. At Disney's Animal Kingdom here in Florida we have raised by hand four African Jaçanas in our nursery.

Habitat and feeding

The African Jaçanas are among the inhabitants of the large free-flight walk-through African aviary described earlier (P. 56) by Greg Bockheim. There are 11 feeding stations throughout the aviary, six on the lower level and five on the upper level. Two of the bowls contain carnivore diet mixed with Mazuri flamingo pellets. The waterfowl bowl has Mazuri waterfowl pellets, small bird breeder and lettuce mixed together. The mixed species bowl has chopped mixed fruit, soaked Mazuri parrot breeder and small bird breeder, lettuce, carrots, seeds and Quicko insectivore diet. The jaçanas have been seen eating at all the feeding stations. Insects are also dispersed throughout the day to all the birds. There has been very little if any interspecific aggression between the jaçanas and other birds.

Breeding

There are three wild caught African Jaçanas in the aviary. The male was purchased from North Carolina Zoological Park and the two females came from Disney's Discovery Island. The male was released in the aviary on January 29th, 1998 after two months of quarantine and acclimation to the aviary. The females were released together on February 6th, 1998.

The first sign of breeding was seen on September 15th, 1998, when the male jaçana began displaying to both females. He threw his head back two or three times then stretched his neck out and began calling. Both females seemed uninterested and the male ceased after a minute. Early September has been recorded as the beginning of the breeding season for jaçanas in the

wild (Postage, 1982). On September 29th, however, it was discovered that the male had moulted his primaries and tail feathers. The breeding female did not moult until October 15th, nearly four weeks after the male had begun moulting. The non-breeding female did not moult at this time. With jaçanas in the wild, the non-breeding females moult first. This should have led to the male to begin displaying to the other female (Tarboton, 1992). On October 9th the male was seen displaying to an unidentified female. He shuffled his feet and danced around her. It was not until October 27th though that we witnessed the 'wing salute' to the breeding female. The male repeated this several times throughout the day. The following day, the male and the breeding female chased the non-breeding female away from the pond area. By December 13th the non-breeding female was moulting.

On December 16th, 1998, the male and breeding female performed the typical mating ritual of jaçanas. The female stretched out her neck with her head held low while at the same time keeping her tail pointed upwards. The male mounted her and attempted to copulate unsuccessfully for three seconds. The male then crouched beneath the female and began lightly pressing his head on her breast, cloaca and under her wings. The male then flew off without attempting to copulate again. Later in the day the breeding female called to the male and the ritual started again. This time they copulated for 18 seconds, with the male moving from the right side to the left side of the female's tail. They continued the mating ritual for the following week, copulating both successfully and at times unsuccessfully.

The first egg was discovered on December 23rd. We had not provided any floating vegetation, and hoped they would lay their eggs on the island under the cover of the rice grass and safe from predators. They, however, chose to lay by the edge of the first catch pool for the waterfall. The nest was poorly assembled. The female had gathered what little vegetation that was in the immediate area and stomped it down. This was the same spot where the pair copulated most frequently. In the wild the male and female African Jaçana copulate on a lily-pad or other floating vegetation on which they plan to nest. It is said this is to test whether it is strong enough to support the weight of the eggs and the chicks. If the nest sinks during mating, they will choose a new nest site (Tarboton, 1992). The female laid an egg each morning for the next three days. The typical clutch size in the wild is three to five eggs, with four being most common (Tarboton, 1992). On the morning of December 29th, there were only two eggs remaining in the nest. The nest and water were checked for any sign of disturbance, but nothing was found. The two eggs that remained were taken to the nursery to be artificially incubated. Two dummy eggs made of wood were put in their place in the nest. The following morning though both had disappeared without trace. The two eggs in the nursery were candled after four days and found to be infertile.

The last nest was so poorly constructed that each time the male left the nest the eggs rolled away a short distance. More vegetation was placed in the nest area and shaped so there would be a cup for the eggs to rest in. The male and female both flew to the area and picked at the new vegetation for about 12 minutes, before flying to the rice grass area. The jaçanas started showing signs of interest again on December 31st, when the male flew to the nest site and began calling. The female responded by flying from the lower pond to the nest and stretching out her neck and keeping her head low. They copulated for 13 seconds. The male then tapped his head on the female's breast and flew off. The female stayed and patted down the vegetation in the nest area. An egg was found in the nest two days later but it quickly disappeared. Another was laid the following morning. It was removed by the keepers and replaced with a dummy egg. This vanished four hours later. The female called to the male about 3.00pm and the male responded by circling her and lightly pressing his head against her underside. No attempt was made to copulate. They repeated this behaviour three times in 15 minutes. The next morning the female laid an egg in the rice grass area. It was later found submerged in the water and removed by the keeper and taken away in the hope that it could be artificially incubated.

The jaçanas spent the next week moving back and forth from the rice grass to the side of the waterfall. They spent time copulating, fixing the nest and going through the mating ritual. On January 13th, 1999 the female laid another egg on the side of the waterfall. Once again, because of our fear of losing another egg, we removed it and took it to be artificially incubated. The following day she did not lay an egg on the nest as expected. Instead a second nest site was discovered. This was on the upper story about 10ft (approx. 3m) from the closest water source. The nest consisted of an old palm frond and other leaves. It was another poorly constructed nest with no visible structure or cover.

The decision was made to leave the egg and monitor the nest to see what happened. We initially thought that the Black Crakes *Amaurornis flavirostris* were predating the eggs. Tarboton (1992) assumed that predation was the leading cause of the low hatching success rate of African Jaçanas' eggs even though no eggs had been seen being predated. In the wild, male jaçanas chase Black Crakes from their territory but ignore White-backed Ducks *Thalassornis leuconotus* (Postage, 1982). Both these species are housed in the aviary with the jaçanas and similar behaviour has been observed. Anytime Black Crakes approach the nest site, the jaçanas chase them away, whereas the White-backed Ducks are tolerated.

As most of the eggs were vanishing at night an infra-red camera and a time lapse video recorder were used to monitor the nest. This enabled us to record the female laying the next two eggs of her clutch. In the wild it was

Photo Susan Congdon

Jaçana chicks at three and five days old

noted that females laid their eggs between 6.07am and 7.55am (Tarboton, 1992). In the aviary at Disney's Animal Kingdom we found that our female laid her eggs between 7.15am and 8.10am. When laying the female squatted slightly and dropped the egg. She then spent five to 10 minutes arranging the nest before she left and the male appeared. The male normally sat on the nest for only one to two minutes before he would fly off.

The morning of January 18th, 1999 brought further frustration. One of the eggs had been cracked open and the other two had been scattered. The two good eggs were removed and taken to be incubated and replaced with one of the infertile eggs. The male inspected the nest after about an hour. He then smashed the infertile egg with his beak and flew off. The Black Crakes began eating the contents of the egg. We immediately examined the video tape to see what had happened. We found that the male hardly sat on the nest during the night. He was typically on the nest for less than five minutes before he would fly off and not return for some time. At approximately 20 minutes past midnight a rat could be seen eating the egg.

The pair began mating again the next day at the upper nest site. This continued for the next four days. On January 25th, 1999 the male called to

the female from the earlier nest site on the side of the waterfall. The following day an egg was found on this lower nest site. This was interesting because wild jaçanas are said to rarely re-use their nesting platforms (Tarboton, 1992). The egg was removed and taken away to be incubated. The female laid daily and ended with a clutch of three eggs. The male and female jaçanas were seen copulating in the rice grass on the afternoon the third egg was laid. They spent the next two weeks chasing the non-breeding female from the pond area and towards the densely planted area.

On February 17th, 1999 the pair again showed signs of mating. The female lowered her head and then the male did the same. They stayed for a few moments and then the male flew off. This behaviour continued for a few more days until on February 20th, the pair were seen copulating at the original nest site next to the waterfall pool. On February 25th an egg was laid at this earlier nest site. The female continued laying until the clutch contained four eggs.

A review of the time lapse video showed the male was sitting tighter on this clutch than on the earlier ones. With the male sitting tighter we were optimistic he would deter other birds from predating the eggs. Then on the night of March 2nd, at 10.30pm, an automatic sprinkler head popped up 2in (5cm) from the nest, startling the male and causing the eggs to be scattered. The male did not return until 7.00am the following morning. On March 4th we went with the horticulture team to cap the sprinkler system so this would not happen again. When we arrived at the nest site the male was not there, but immediately came and watched while we worked. He did not vocalize or show any aggression. However, he unfortunately never again returned to this nest area. We had suspected this might happen, but a study in Africa encouraged us to think differently. Of 99 nests checked, not a single male abandoned the nest due to human disturbance (Tarboton, 1992); even after the males were trapped, checked and weighed. In our case, one egg was missing when the sprinkler was capped. The other three were left in the nest in the hope that the male would return. At 5.45pm two Black Crakes were caught on film eating two of the remaining three eggs. The fourth was removed and taken to be incubated.

The male began moulting on March 15th, 1999 and the breeding pair was seen copulating for the last time on April 13th. An egg was found the morning of April 19th but vanished quickly. It was the female's nineteenth and final egg of the season that had lasted from mid-December until mid-April 1999.

Using time lapse and infra-red video, we have been able to evaluate some of the challenges facing the jaçanas when attempting to successfully incubate their eggs. Some we had anticipated, and some we had not. We knew that rats and other predators were likely to be a problem. Similarly,

we feared the crakes might be a problem as they also breed in the pond area. We had not, however, anticipated the sprinkler popping up and scaring the male off the nest. Water lilies have now been planted in and around the rice grass island in an attempt to encourage the jaçanas to use these during the coming breeding season.

Hand rearing

The jaçana eggs were incubated in the DAK nursery at 99.9°F (37.7° C) and hatched after 22 and 23 days of incubation. The eggs hatched on January 18th, February 5th, 19th and 20th. Each weighed about 5g. Three other eggs hatched but the chicks did not survive past the seventh day. One had the umbilicus wrapped around its left leg and had to be assisted in hatching. It showed some interest in food but died on the first day. Another had to be euthanized due to a slipped tendon on the second day. The third died on the seventh day possibly due to a yolk sac infection.

The chicks were raised primarily on a diet of small crickets, live brine shrimps, minced newborn mice and finely crushed Mazuri gamebird starter. Mealworms were added to the diet on the eighth day. Crickets and live brine shrimps were the initial food preference of all four chicks. Later, the preference changed to crickets and gamebird starter. The chicks were initially fed crickets every hour, later switching to every two hours. The crickets fed to the chicks were not dusted with vitamins or minerals but instead fed Mazuri cricket food for 24-48 hours.

No attempt was made to isolate the chicks from the sight or sound of humans. A puppet was used briefly (three to five days) for feeding all except for the first chick. It was made from large forceps, gauze and medical tape. Coloured pencils and markers were used to colour the puppet to look like an adult. The puppet was introduced to the second chick a week after hatching. The following two chicks were fed using the puppet from hatching and were much more receptive to it. Although the chicks were attracted to the puppet, it is too early to determine whether this impacted upon the chicks' development.

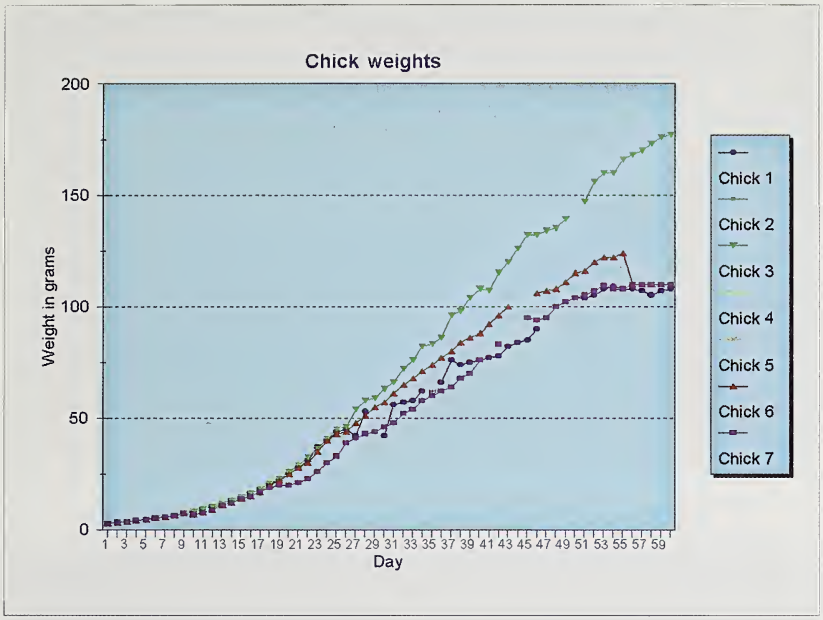
They were housed in a brooder until the 15th-20th day at 98°F (36.7°C) and this was then decreased as needed. They were later placed in 3ft x 3ft x 18in (91.5cm x 91.5cm x 46cm) and 4ft x 4ft x 30in (approx. 1.2m x 1.2m x 76cm) Plexiglas (perspex)-sided open brooders with radiant heat. Both had towels and rubber matting for substrate. Artificial grass was placed in a corner at first and then all around as they became acclimated. A feather duster was placed in the corner of both brooders. Initially the chicks spent a majority of their sleeping time under the dusters. A mirror was used with the first chick after the 19th day, the second inconsistently after the second day, and from hatching with the third and fourth chicks. The second chick

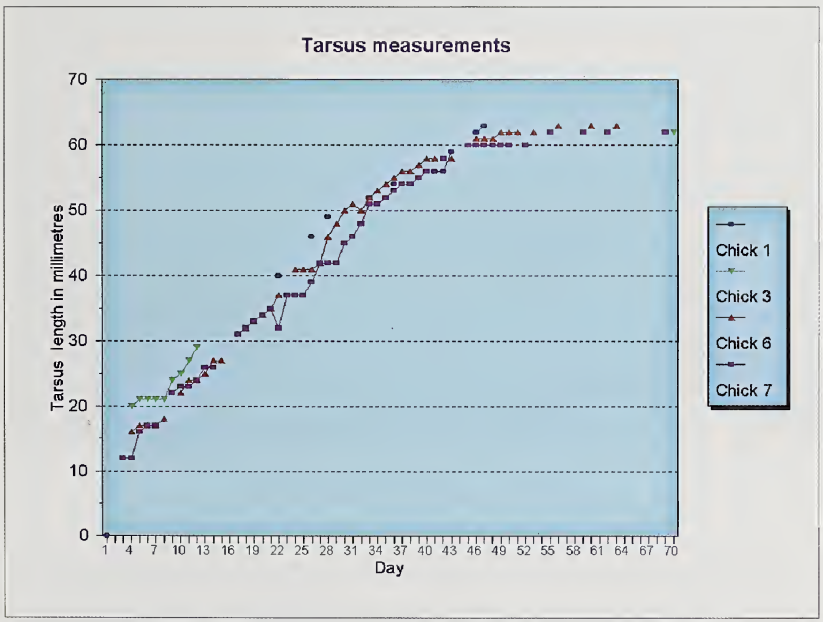
Photo Susan Congdon

Jaçana chicks at three and five days old being fed using puppet

Photo Susan Congdon

Jaçana chick at 19 days old


Chick weights
Weight in grams
200
150
100
50
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59
Day
Chick 1
Chick 2
Chick 3
Chick 4
Chick 5
Chick 6
Chick 7


Tarsus measurements
Tarsus length in millimetres
70
60
50
40
30
20
10
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70
Day
Chick 1
Chick 3
Chick 6
Chick 7

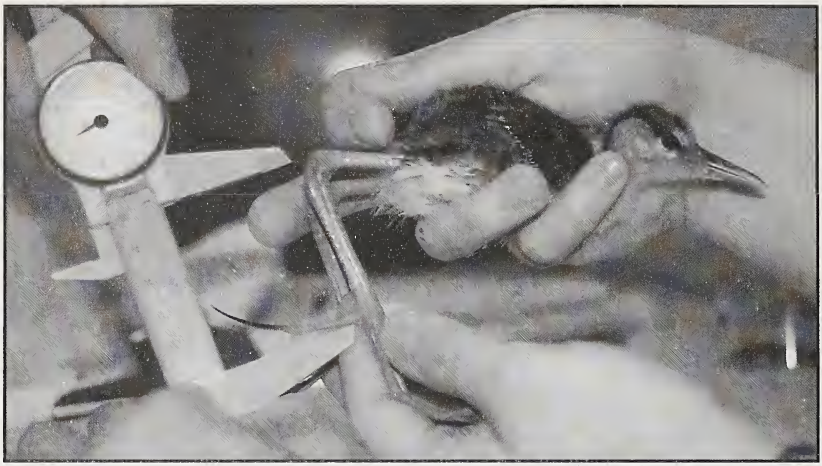


Photo Susan Congdon

Measuring the tarsus of 30 day old chick

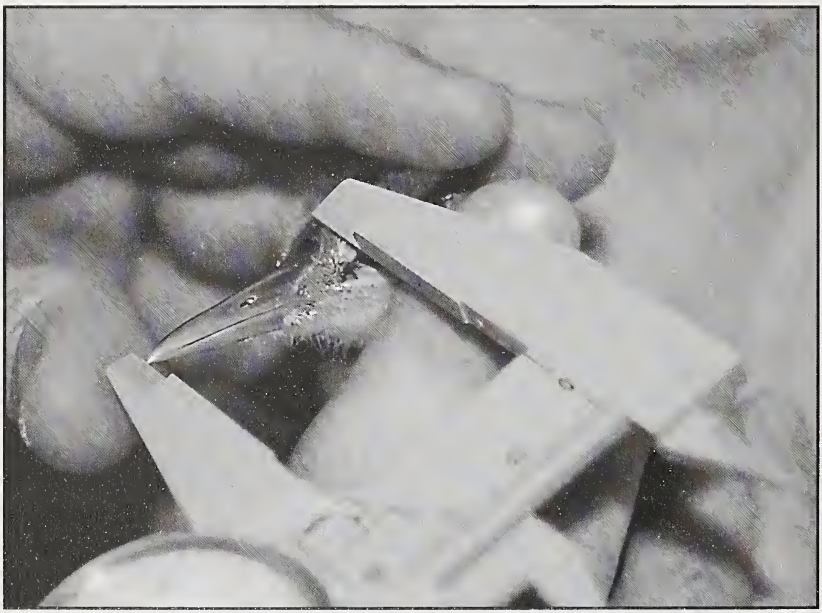


Photo Susan Congdon

Measuring the bill of 30 day old chick

often stood in close proximity to the mirror. All chicks were initially housed alone except for the fourth, which was placed with the third as soon as it was dry. The first two chicks were introduced when the first chick was 30 days old and the second chick was 17 days old. A physical barrier was used

initially as a precaution due to the larger size of the older chick. Though the younger chick was much smaller, a second food source had to be added due to displacement of the older, larger chick.

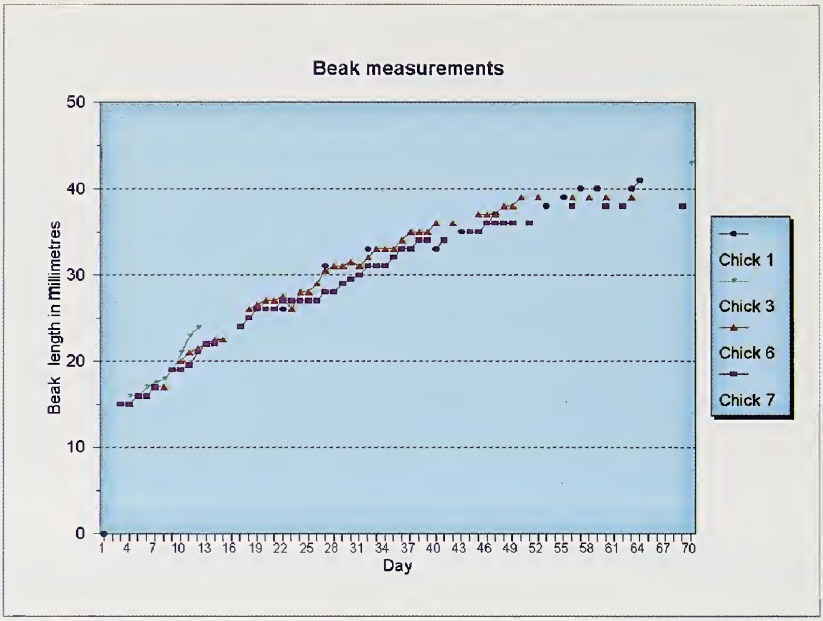
There were some minor health problems associated with the surviving chicks. The second and fourth chicks had to have their toes taped to stop them from turning outwards. This occurred on the 29th and 18th days respectively. The taping corrected the problem within five days. The second chick's 0right leg deviated at the ankle joint causing the bird to limp. This chick was housed in a small brooder until the 15th day. After this chick was moved to a larger enclosure and had more exercise the problem corrected itself. Subsequently, the third and fourth chicks were moved to a larger enclosure at an earlier age. Some cracks in the plantar surface of the foot were easily healed by using A & D ointment and allowing the chicks access to more water.

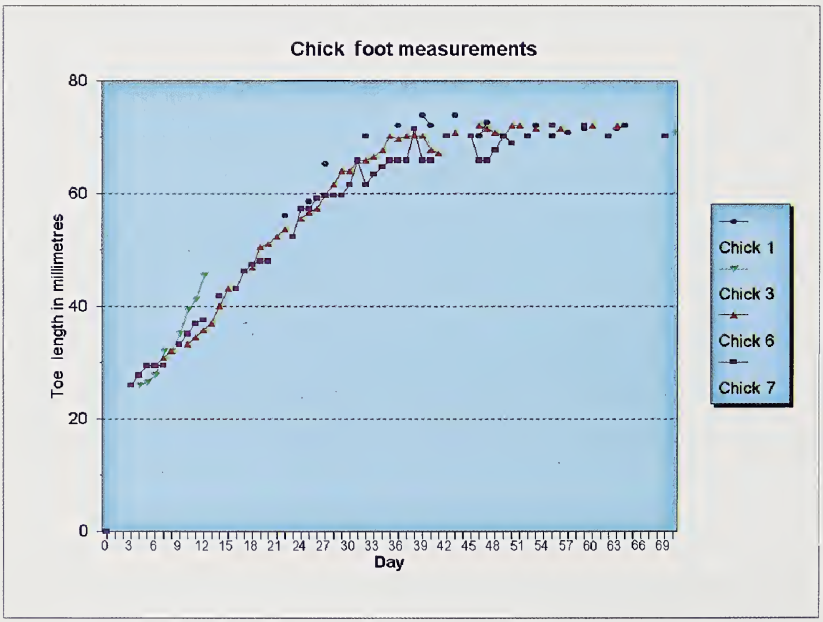
The weight of each chick was taken daily. Graph 1 (p.69 top) shows the daily weight of each of the seven chicks that hatched in the nursery. All four surviving chicks were similar in weight until about the 25th day. At this point the female began to increase in weight faster than the three males. The weights of the chicks appeared to level off at about the 60th day. One chick, now known to be the female, levelled off at 180g while the three males levelled off at 110g-120g. It appears, therefore, that they may be able to be sexed by weight, however, they were karyotyped to confirm this.

Calipers were used to measure the growth rate of each chick's tarsus, beak/shield and toes. The toe measurement was obtained by measuring from the tip of the third digit to the back of the surface pad, then adding this to the length of the hallux. Neither toenail was included in the measurement. Measurements were not taken of the first chick until the 22nd day because being the first chick to hatch we wanted to assess the rearing difficulty first. The third chick was measured from the fourth day until the seventh day when the above mentioned leg problem occurred. Measurements resumed on the 70th day but had levelled off by this time. The 70th day is included on the graph for a male/female size comparison. Measurements of the other two chicks were taken throughout their development.

Graph 2 (p.69 bottom) charts the tarsus measurements of the four surviving chicks. There appeared to be no major differences in the rate of tarsus growth between the males and the female. As shown on Graphs 3 and 4 (p.72) beak and foot growth did not differ between the female and males either. As more chicks hatch in the nursery, this will become an ongoing project, and a larger sample may reveal more differences between male and female development.

The chicks were on view to guests (or visitors) for much of their development, and due to their unusual appearance they were a huge hit. At the time of writing, all four are cohabiting in a small aviary with a pool,


Beak measurements
Beak length in Millimetres
0
10
20
30
40
50
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70
Day
Chick 1
Chick 3
Chick 6
Chick 7


Chick foot measurements
Toe length in millimetres
0
20
40
60
80
0 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69
Day
Chick 1
Chick 3
Chick 6
Chick 7

sand-box, plants and banana leaves. On the first day there was slight aggression from the second chick, which because of its weight we suspected was the only female, and this was confirmed later. This aggression has not been seen much since. The chicks spend most of their time in the large pool.

Acknowledgments

This paper was only made possible due to the diligent efforts of the Africa aviary team and the nursery staff at Disney's Animal Kingdom: Shannon Mezzell, Lyn Heller, Jeff Ignaut, Greg Bockheim, Susan Stevens, Lynne Silkman, Lynne Sutcliffe, Allison Keeley, Jody Daugherty, Greg Bruehler and Trisha Olow. The Disney's Animal Kingdom's bird department management team of Grenville Roles, Chelle Plasse and Scott Barton and Nursery Manager Suzie Kasielke contributed beneficial insights.

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DR LUIS FELIPE BAPTISTA

Dr Luis Felipe Baptista died on June 12th while tending the garden of his home at Sebastopol, California. He was 59. He last wrote in the magazine in 1994 (Vol. 100, No. 4, pp183-188) on Aviculture's Contribution to Science and Conservation. An Obituary by Ian Hinze will appear in the next issue.

CHESTER ZOO BIRD REVIEW 1999

by Roger Wilkinson

The highlight of 1999 was the arrival of a pair of Red Birds of Paradise *Paradisea rubra* received on loan from the New York Zoological Society, the Bronx/Wildlife Conservation Park, New York. Two of the Chester Zoo senior bird staff went to the Bronx where they spent time working with the birds before returning to Chester accompanying the Red Birds of Paradise. These birds which were bred at New York in 1998 are currently held in our purpose built off-show bird of paradise breeding area and will be transferred to the on-show breeding aviaries in the new 'Islands in Danger' exhibit when it is ready.

Two White-eared Catbirds *Ailuroedus buccoides* bred at Stuttgart Zoo have also recently been received at Chester and will also be gracing one of the 'Islands in Danger' aviaries. Another aviary is planned to hold New Guinea Blue-crowned Pigeons *Goura cristata*, Duyvenbode's Lories *Chalcopsitta duivenbodei* and Stella's Lorikeets *Charmosyna papou*. This exhibit will also house a pair of St. Lucia Amazon Parrots *Amazona versicolor*, to be received on loan from Jersey Zoo, and includes a spectacular enclosure for Komodo Dragons *Varanus komodensis*.

Another important species received into the collection in 1999 was the Vietnamese Pheasant *Lophura hatinhensis*. A pair of these endangered pheasants were received on loan from the World Pheasant Association, the male having been bred at Antwerp Zoo and the female at the Old House Bird Gardens, nr. Reading, England.

Mountain Peacock Pheasants *Polyplectron inopinatum* were especially productive in 1999. After a barren year in 1998 when no eggs were laid, this year the female laid nine eggs. Despite our best efforts to screen the area where she made her scrape with planting, she chose not to incubate any of these eggs and we were obliged to remove them for artificial incubation. Six chicks were hatched of which four were reared successfully. Other pheasants bred in 1999 included Malay Crested Fireback *L. erythrophthalma erythrophthalma*, Satyr Tragopan *Tragopan satyra* and Golden Pheasants *Chrysolophus picta*. One Blyth's Tragopan *T. blythii* was hatched from five fertile eggs but it died shortly after hatching. This repeated the problems we have had previously with embryo and chick viability in these pheasants and may perhaps in part be explained by inbreeding depression in this stock. However, we would be pleased to hear from anybody who has had experience in improving egg viability through nutritional or incubation management. Four Common Peafowl *Pavo cristatus* were reared and although two Green Peafowl *P. muticus* were hatched neither was reared. Five Roulroul Partridges

Rollulus roulroul were reared including four that were parent-reared. Two Red-legged Partridges *Alectoris rufa* were reared from eggs laid in 'Europe on the Edge'. Chinese Painted Quail *Excalfactoria chinensis* hatched but failed to rear two chicks in the 'Finch Flight'.

As in 1998 we followed the EEP (European Endangered Species Breeding Programme) Humboldt Penguin *Sphenicus humboldti* coordinator's request and bred only from genetically under-represented birds. Four penguin chicks were hatched of which two were reared successfully. Waldrapp Ibis *Geronticus eremita* successfully reared eight chicks. There are now over 700 Waldrapps in zoos and bird gardens in Europe and this is another species which we now have to actively manage to control breeding in our collections. How different this situation is to that only 10 years ago when we were hand-rearing Waldrapp to maintain our breeding colony. In contrast to the now productive Waldrapps, the Little Egrets *Egretta garzetta* sharing their enclosure failed to rear any of the chicks they hatched. The European Spoonbills *Platalea leucorodia*, also in 'Europe on the Edge', laid for the first time. The eggs were left with the parents but although the eggs were fertile they failed to hatch. Also for the first time at Chester two pairs of Dalmatian Pelicans *Pelecanus crispus* built nests. One of the female pelicans laid and incubated an egg but as with the spoonbills this fertile egg failed to hatch.

Caribbean Flamingos *Phoenicopterus ruber ruber* bred particularly well in 1999 with a total of eight birds reared. Chilean Flamingos *P. chilensis* laid later in the year and unusually in 1999 with only two chicks reared were less successful than their Caribbean cousins. From 1990 to the end of 1999 the Chilean Flamingo flock increased in size through breeding from 28 to 48 birds and the Caribbean flock from 40 to 59 birds. Careful egg management is practised by the flamingo keeping staff. Eggs are removed as they are laid and replaced with dummy wooden eggs. Because of the loss of eggs and dummies by being knocked off the nest by other flamingos, each wooden egg has a thick nail hammered into it so it can be spiked into the nest. Despite the parents being unable to turn these dummies they are accepted by them and maintain the birds' incubation behaviour until their own egg is returned before internal pip. This also permits many other management options. For example, if their own egg proves to be infertile the dummy may be removed thereby encouraging the pair to relay or the fertile egg from another pair may be fostered to them.

The flamingo nests are mapped and regular observations made of incubating birds so that parentage of all eggs on nests can be recorded. Eggs are numbered and marked with a pencil. Careful egg and nest records ensure the parentage of eggs and chicks can be recorded. Shortly after hatching each chick is pinioned and a web tag attached to the web of skin between

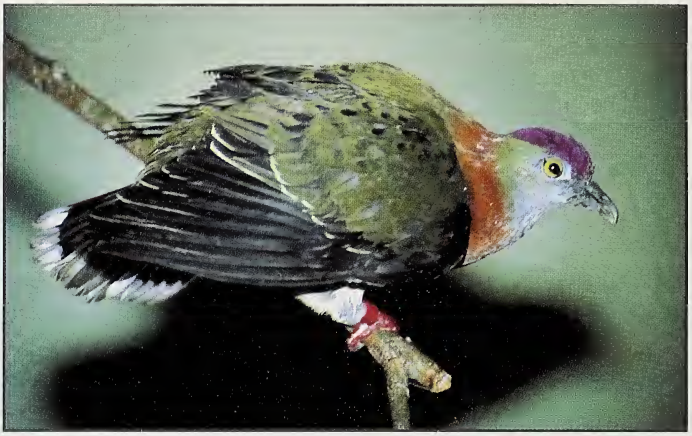


Photo Roger Wilkinson
Male Superb Fruit Dove

Photo Roger Wilkinson
Superb Fruit Dove fledgling

the toes. These web tags are numbered so that later in the year when the young flamingos are caught up for ringing (we use Darvic leg bands above the 'knee') the ring details can be recorded for each youngster along with parentage and individual history. Only occasionally are eggs discovered on the ground between nests for which the parentage cannot be determined.

Waterfowl bred included two Black-necked Swans *C. melanocoryphus*, two Cuban Whistling Ducks *Dendrocygna arborea*, a Ross's Snow Goose *Anser rossii*, 13 Marbled Teal *Marmaronetta angustirostris*, eight Northern Shovelers *Anas clypeata*, three Ferruginous Ducks *Aythya nyroca*, eight Carolina Wood Ducks *Aix sponsa*, three Mandarin Ducks *A. galericulata*

Photo Roger Wilkinson

Wrinkled Hornbill

and three Smew *Mergus albellus*. However, 1999 was a very disappointing year for crane breeding with chicks hatched but not reared from Red-crowned Cranes *Grus japonensis* and West African Crowned Cranes *Balearica pavonina pavonina*.

A Superb Fruit Dove *Ptilinopus superbus*, a Jambu Fruit Dove *P. jambu* and three Golden Heart Pigeons *Gallicolumba rufigula* were successfully parent reared. The latter are particular favourites of mine and it was a pleasure to breed from them. A Pink Pigeon *Nesoenas mayeri* was foster reared by Java Doves *Streptopelia risoria* dom. One Mindanao Bleeding Heart Pigeon *G. criniger* was hatched but this was not reared and a Nicobar Pigeon *Caloenas nicobarica* which was hand-reared died before it became independent. Crested Bronzewing Pigeons *Ocyphaps lophotes* and Common Bronzewing Pigeons *Phaps chalcoptera* also hatched chicks and Speckled Pigeons *Columba guinea*, Rock Doves *C. livia* and Diamond Doves *Geopelia cuneata* were reared. A Tawny Frogmouth *Podargus strigoides* was reared as were two Spectacled Owls *Pulsatrix perspicillata*, three Snowy Owls *Nyctea scandiaca* and a Barn Owl *Tyto alba*. Because of reduced demand for Snowy Owls we had planned not to breed this species in 1999. Once eggs were laid these were removed and replaced by dummies. However the female laid further eggs adding to the dummy clutch and these went undetected and hatched.

Highlights in the Parrot Section included the successful parent rearing of three Mount Apo Lorikeets *Trichoglossus johnstoniae*, a Yellow-backed Chattering Lory *Lorius garrulus flavopalliatus* and a Duyvenbode's Lory *Chalcopsitta duivenbodei*. The Greater Vasas *Coracopsis vasa* laid four

eggs but because of lack of interest in this species from other zoo collections we removed and discarded two of the four eggs. The remaining two eggs hatched under the parents and both chicks were reared. Because they are already well represented with many youngsters in the managed EEP/ESB populations we decided not to breed the Green-cheeked Amazons *Amazona viridigenalis*, Red-fronted Macaws *Ara rubrogenys* and Blue-eyed Cockatoos *Cacatua opthalmica* in 1999. Sadly the Red-fronted Macaws were lost late in the year following the use of levamisole as a worming agent. I would strongly caution against the use of this anthelminthic by injection in this species. A Red-tailed Amazon *A. brasiliensis* was hatched but failed to survive and later in the year we were saddened by the death of the breeding female. A new female bred in 1998 at the Tropical Bird Gardens, Rode, was located and this has joined the widowed male at Chester as part of the managed EEP breeding programme. Other parrots bred included three Cuban Amazons *A. leucocephala*, one Thick-billed Parrot *Rhynchopsitta pachyrhyncha*, three Slender-billed Conures *Enicognathus leptorhynchus* and a Golden-capped Conure *Aratinga auricapilla*.

Chester Zoo had its first success breeding Wrinkled Hornbills *Aceros corrugatus* in 1995 when a brood of four chicks was successfully parent-reared. Both parents were confiscated birds received on loan from HM Customs & Excise in December 1986. They first attempted to breed in 1990 and in 1991, 1992 and 1993 hatched but did not rear chicks. The success of 1995 was followed by a further successful breeding in 1996 but on that occasion only one chick was reared. Wrinkled Hornbills are threatened in the wild and since 1997 have been the subject of an EEP. All five Wrinkled Hornbills were lent to other EEP participants; one female to Aalborg, Denmark, two females to the Tropical Bird Gardens, Rode, UK, one female to Upie, France and a male to Paignton, Devon, UK.

In 1997 the Wrinkled Hornbill pair again attempted to breed but lost both youngsters, one of which survived to over nine weeks old. The pair then made a second nesting attempt but the female emerged from her last attempt in very poor physical condition and died shortly afterwards from what the post mortem indicated to be chronic liver disease. Evidence of haemochromatosis (iron storage disease) was looked for but not found and the aetiology of the liver disease remains unknown. In December 1998 we were pleased to receive an adult female on loan from Antwerp Zoo. The female was quarantined before being introduced to our male. Our male was extremely attentive trying to feed her immediately but she wanted only to hide from him and initially appeared very unrelaxed in his company. After several unsuccessful attempts at introducing these birds the female was again introduced to the male on February 8th 1999, and only 10 days later was seen being fed by the male at which time she began mudding-up the nest-box entrance. She remained in the nest-box from February 1999 and emerged

110 days later with two strong chicks, a third equally healthy chick fledging three days later. As with a number of other Asiatic hornbills both sexes of juveniles resemble the male on fledging. With almost twice as many females as males in the EEP population we hoped that our previous imbalance of sexes would be reversed but they proved to be two females and one male. The male has since been transferred to the Tropical Bird Gardens, Rode, where it is now paired to a female that was bred at Paultons Park, Ower, Romsey. The two 1999-bred female Wrinkled Hornbills have been sent to Heidelberg Zoo where a group of this species is being assembled to facilitate natural partner choice in the expectation that this may increase the number of pairs breeding successfully.

Lilac-breasted Rollers *Coracius caudata* successfully reared three chicks in their aviary in the Tropical Realm but the pair of Green Wood Hoopoes *Phoeniculus purpureus* made no breeding attempts following the transfer of their previous year's offspring to Paradise Park, Hayle. Perhaps as co-operative breeders in the wild the wood hoopoes would have been more inclined to breed had the family group remained intact. The Laughing Kookaburras *Dacelo novaeguineae* reared a single chick and the Blue-winged Kookaburras *D. leachii* made their first breeding attempt after six years in the collection. The female Blue-winged Kookaburra laid a clutch of two eggs but these proved infertile. Three Violaceous Turacos *Musophaga violaceous*, four Schalow's Touracos *Tauraco schalowi*, a Red-crested Touraco *T. erythrolophus* and four White-cheeked Touracos *T. leucotis* were bred.

New arrivals were a pair of Magpie Robins *Copsychus saularis* and two Pope Cardinals *Paroaria dominicana* bred at London Zoo. These were initially housed in the free flight area of the Tropical Realm but the Magpie Robins proved to be such accomplished escape artists that they are now confined to barracks in one of the aviaries in this building. Birds bred in the Tropical Realm in 1999 included Emerald Starling *Lamprotornis iris*, Scissor-billed Starling *Scissirostrum dubium*, White-rumped Shama *C. malabaricus*, Red-billed Leiothrix *Leiothrix lutea* and Silver-beaked Tanager *Rhamphocelus carbo*. Two Bali Starlings *Leucopsar rothschildi* were hand-reared. Yellow-throated Laughing Thrushes *Garrulax galbanus* and Red-winged Laughing Thrushes *G. formosus* hatched chicks in the free flight area of the Tropical Realm but these were left with the parents and none were reared successfully. Food competition and disturbance in this mixed species area may have contributed to these nest failures and some chicks may be taken for hand-rearing in the future.

A total of nearly 200 birds, of 62 species, was reared in 1999.

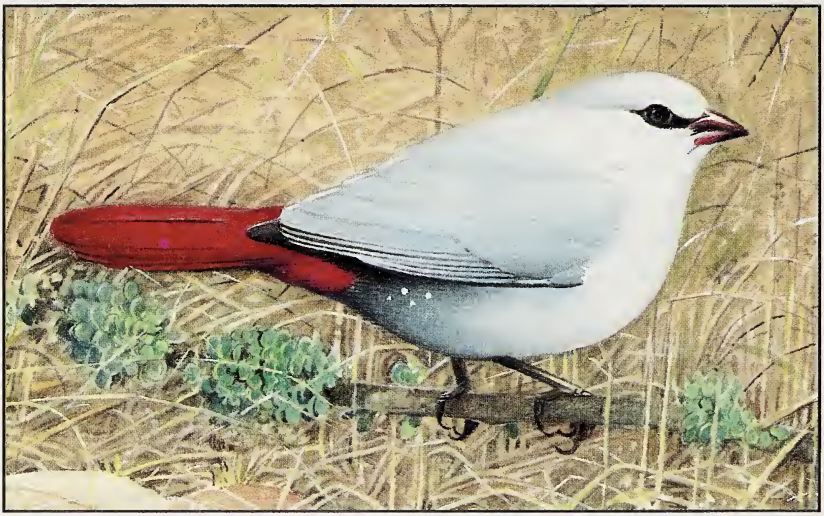
Dr. Roger Wilkinson is now General Curator: Higher Vertebrates and Research Co-ordinator at Chester Zoo, Upton, Chester CH2 1LH, England.

WAXBILLS AND THEIR ALLIES: THE LAVENDER WAXBILL

by Ian Hinze

Genus *Estrilda* - the typical, swee and lavender waxbills

All the species that are thought of as typical or 'true' waxbills are included in this genus, which is a remarkably homogeneous group. It includes the Common, Black-rumped and Orange-cheeked Waxbills *Estrilda astrild, E. troglodytes* & *E. melpoda*, which have been imported into Europe for centuries and those sealing wax-like red bills gave rise to their English name.



Lavender Waxbill

Most possess finely barred plumage and are endowed with tremendous agility, being able to feed by clinging to growing grasses, hold their food under one foot and manipulate nesting material. Their nests tend to be fairly large structures with a tubular entrance and, usually, a cock-nest on top or alongside. The swee and lavender waxbills diverge slightly from the norm in some respects and the latter are believed to be a link between the typical waxbills and the firefinches *Lagonosticta* spp.

Lavender Waxbill *Estrilda caerulescens*

Other names; Lavender Finch, Red-tailed Waxbill, Red-tailed Lavender Waxbill

Description

Length 10cm (4in). The sexes are alike. The lower back, rump, upper and under tail-coverts and the central tail feathers are a deep, rich crimson. There is a short and narrow black eye-line from the gape which tapers to a point just beyond the dark brown eye. The cheeks, throat and upper breast are whitish grey. The centre of the belly and lower flanks are sooty grey to almost black. There are small white spots on the lower flanks. The rest of the plumage is a most attractive light bluish grey. The tip of the bill is blackish, as is usually the culmen and lower part of the lower mandible. The base of the bill, especially at the centre, is bluish grey to dark reddish. The legs and feet are blackish brown, black or very dark olive. The juvenile's rump to the base of its tail is a slightly paler, duller crimson and the black lores are not so well defined. There is also an absence of spots on the lower flanks.

Field guide

It is a tiny, active bluish grey bird with black lores, and a crimson lower back, rump and tail.

Distribution

Tropical western Africa in Senegal, Gambia and Guinea-Bissau east through southern Mali, southern Burkino Faso, northern Ghana, northern Nigeria, extreme northern Cameroon, north-west Central African Republic and south-west Chad.

Status

Common or locally common.

Introduced distribution

Introduced to the Hawaiian Islands (Hawaii and Oahu) around 1965 (Lever, 1987) and apparently established, but numbers declined by 1980 and it is now considered unlikely to survive (Clement et al. 1993).

Berger reported that this species has been on Oahu since 1965, after having been deliberately or accidently released. Birds were recorded in the Kapiolani Park - Diamond Head area from 1966 to 1976, although no breedings were recorded. In late 1976 or early 1977 it was estimated that only 30-50 birds made up the entire population. In 1978, Ashman & Pyle found the bird established on the island of Hawaii, in a small area near the Puu Waawaa Ranch, and also indicated that it is established on Oahu (all reports in Long, 1981).

Voice

The close contact call is a short, shrill, high-pitched 'squee' or 'tsee', which is lengthened and intensified to '*tseeay*' (Immelmann et al. in Goodwin, 1982), or 'a shrill, explosive squeep' (Harrison in Goodwin, 1982). The distance or high intensity contact call of the female is a two or three-syllabled '*tseeeht-tseeeht-tseeet*', which the male answers with his song phrase - a two-syllabled '*seeyou*' (Harrison in Goodwin, 1982), the first note high-pitched and short, the second longer, lower pitched and more melodious. This seems to be confirmed by Claflin (1994), who bred from 12 out of approximately 15 pairs, and reports the male emitting a two-note call, first up and then down, with the female making two or three short calls, each one sounding the same, and Dodwell (1993), who, while finding the 'distinctive two-note call' of the male to be one hundred percent reliable, is quick to stress that birds which do not use this two-note call are not always females; some males refused to call if they were within sight or sound of other, presumably dominant, males. Goodwin (1982) gave the nest call as a soft '*tseeteek tseeteek teek teek*'.

Habitat, feeding and general habits

It is found in semi-arid country with bushes and/or trees and some open areas, rocky places with mimosa and other shrubs, areas of short grass with scattered or adjacent bushes or trees, the grass verges of roads and sometimes gardens and cultivated areas that provide comparable conditions (Goodwin, 1982; Serle et al. 1977). It feeds on the ground but is also more arboreal than other species (Barlow et al. 1997). It is usually spotted in pairs or small groups, sometimes with other waxbills and weavers, and with larger aggregations not uncommon. It is often tame and confiding and has a low, direct and fairly fast flight compared with other waxbills (Clement et al. 1993; Serle et al. 1977).

Records in the field (Brickell, 1995 pers. com.) revealed seeds, mainly grasses but also small plant seeds (species unknown) being taken. Some insects and ripe fruit are also consumed.

Courtship display

The male holds a piece of nesting material in his bill by one end, makes a triangular head and angles his tail, then bobs up and down like other *Estrilda* species. The female responds by giving a greeting or nodding display, i.e. partly turns towards the male with triangular head, angled tail and the rump and flank feathers erected, but showing a smooth-looking surface. Both birds may then perform bowing or nodding movements, heads turning slightly inwards, sometimes with one bird having its head up while the other's is

down and vice-versa. The male usually starts to sing and the female replies with her contact call. The female then solicits the male with quivering tail. She may also take the initiative and perform the display with the nesting symbol herself.

The greeting or nodding display is performed frequently and intensely by courting or recently paired birds, but only by established pairs if they have been separated for a short period and then meet up again or if a strange individual is close by. It therefore appears to be given when the bird's aggression is aroused but it is inhibited from attacking by sexual attraction. As Goodwin (1982) pointed out, if two strangers are put together the display may be interspersed with aggression and fleeing even if the birds are of the opposite sex. Should they be two males or two females, then it could be superseded by violent fighting in which the loser may well be seriously hurt if it cannot escape or be removed in time.

Nesting

Nest building takes place in the second part of the rainy season (Koepff, 1984). The nest itself is an untidy dome-shaped construction of seeding grassheads. Five nests examined were approximately 20cm (8in) in diameter and each had an entrance tunnel on one side, about 5 cm (2in) long and 3.5cm (almost 1½in) in diameter, which pointed downwards; three were sited in the forks of citrus trees and two in exotic shrubs. A clutch of eggs averages 4-6. Barlow et al. (1997) state it has been recorded breeding in the Gambia in the mid rainy season, from August to September.

Captive observations

A frequently available species and arguably the most beautiful. A truly healthy specimen is constantly on the move and extremely captivating. Freshly imported birds require plenty of warmth, around 77°F (25°C) for the first few weeks (Koepff, 1984). Although first bred in the UK in 1900, by Miss R. Alderson (Coles, 1987), for a long time afterwards breedings were extremely rare in captivity. Now a growing number of aviculturists have been successful, particularly when pairs have been housed on their own. Groups of birds kept together outside the breeding season are renowned for feather plucking and during the breeding season have produced fatalities due to fighting.

Dodwell (1993) found it was three years before his birds reared young, and then only after finding compatible pairs that produced fertile eggs. Still, not all his pairs reared young and a considerable number of clear eggs continued to be laid. However, of those young that hatched, losses were negligible. The majority of his birds favoured building their nests in holes in small hay-bales, although some utilised wicker baskets and others

constructed their own. Claflin (1994) covered the tops of the, presumably all-wire, breeding cages with hay and pine branches and the sides with burlap, afterwhich the cages were misted twice each day to bring the birds into breeding condition. Thurlow's (1985) birds built their nests in shrubbery.

Most favoured nesting materials appear to be grass stems and coconut fibres, with the latter and a few feathers used as a lining. One of Thurlow's (1985) pairs constructed a rather untidy structure with a well concealed entrance underneath a grassy overhang. The overhang became a small platform on which the birds placed small pieces of cuttlefish bone and soil.

For the first week after hatching Dodwell (1993) found the nestlings appeared to be fed almost entirely on livefood. After this period soaked seed and softfood were taken, with the livefood becoming somewhat reduced. In addition to the livefood de-frosted frozen bloodworm, an insectivorous mixture and seeding grasses were also provided. Young birds called quite loudly when either parent entered the nest. Fledglings spent the first day on the ground, but normally found a sheltered place in which to roost thereafter. None of the birds appeared to return to the nests although Koepff (1984) mentioned that this species roosts in unused nests, including those of other species. The incubation period is 11-12 days, with the fledging period some 16-20 days after hatching. The parents continue to feed the young for about 14 days after fledging. During the nesting period it is wise not to inspect the nest as this has resulted in young being abandoned. Thurlow (1985) found his adult birds enjoyed taking the juice and flesh from slices of ripe pear.

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Ian Hinze's main interest is waxbills, and the above comes from a book he has written on the subject, for which he is hoping to find a publisher. Ian (E-mail:Calian@tesco.net) lives in Manchester, England.

THE NEW PENGUIN DEVELOPMENT AT WHIPSNADE

by Nick Lindsay

During the winter of 1998-1999 Whipsnade Wild Animal Park completely redeveloped its penguin enclosure following a successful fund-raising campaign run by the keeping staff. In some ways the decision to redevelop the area was a bold one as, although showing the ravages of time, this area continued to produce breeding successes for all three species - Humboldt Penguin *Spheniscus humboldti*, Rockhopper Penguin *Eudyptes chrysocome* and King Penguin *Aptenodytes patagonica*. It was recognised by the keepers however, that each species has different requirements and the area was really too small to provide sufficient opportunities for the three. The aim of the redevelopment, therefore, was to provide a larger area of water and for this to be of a greater depth (3m (approx. 10ft)) than previously available, to provide a more challenging land space and to provide a better setting overall for the birds and visitors. Because of the increasing problem of malaria in the UK and to keep costs down it was decided to redevelop the existing area which has as good a natural air conditioning system as one could ask for in southern England (for those who don't know, it is situated high on the Dunstable Downs).

The original pool has been maintained with a second pool built adjacent to this but at a different level. The shape of this was very much determined by the existing landscape and the planning authorities. This extension allowed the provision of a greater land area in a more exposed site with the aim of encouraging the penguins to cover more ground and gradients. Between the two pools a rock mound has been developed with water flowing down this into each pool. Pumps circulate the water through sand filters and UV filters before it flows down the waterfalls within which shingle traps have been incorporated to act as a natural (and additional) filtration system. Each pool has an independent system so a pump or filtration failure will affect only one pool and not the other. The land area has been landscaped using wonderful Welsh slate and granite along with sand, shingle and cobbles. The area, both inside and around the outside, has been planted with dwarf conifers, pampas grass and other tussock grass varieties which amazingly survived the attention of the penguins during the first year.

Although the penguins were returned to the new area in time for the 1999 breeding season only a few Humboldt Penguins bred. The activity of all species has increased tremendously and the Rockhoppers, in particular, have made use of even the biggest rocks, often each individual claiming a rock for itself on which to rest during the day. The King Penguins walk around the whole area and are quite happy to walk up the waterfalls rather

than taking an easier route. All the species use the deeper pools. The sand areas, and in particular the slate slabs, are very much appreciated by the penguins and in the summer misters are used in some of these areas to cool the penguins. The quality of the water has remained good although algal growth has occurred on the sides of the pools. This year a vacuum cleaning system is being used to remove this and the pumps are producing a stronger current in the pools, as well as circulating the water. Fibreglass nest-boxes have been developed for the Humboldt Penguins. These can be removed and cleaned at the end of each season.

A completely new information system has been introduced with both static boards and interactive information disks on all penguin species. The public viewing areas have been greatly enhanced and although there is no underwater viewing visitors can see the penguins swimming in both pools. The setting is probably one of the most spectacular any penguin exhibit can offer and visitors spend a considerable amount of time in this corner of the park.

Nick Lindsay is Curator at Whipsnade Wild Animal Park, Dunstable, Bedfordshire LU6 2LF, England. Tel: 01582 872171/Fax: 01582 872649.

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PLANET PENGUIN

The largest penguin exhibit in the world, Planet Penguin, was opened last November at Loro Parque, Tenerife, Canary Islands. The spectacular main exhibit houses 65 King Penguins *Aptenodytes patagonicus*, 46 Rockhopper Penguins *Eudyptes chrysocome*, 40 Gentoo Penguins *Pygoscelis papua* and two Kelp Gulls *Larus dominicanus*. Most of the King Penguins were hatched from eggs collected during the expedition to South Georgia, described by Roger G. Sweeney in the *Avicultural Magazine* 104,4:169-179. From the 117 eggs brought back to Loro Parque, 70 chicks were hatched of which 51 were reared successfully. The other King Penguins, along with the Rockhopper and Gentoo Penguins, were bred at Sea World in the USA. A second exhibit displays 23 Humboldt Penguins *Spheniscus humboldti* obtained from Penscynor Wildlife Park (south Wales, UK), which closed in 1998.

THE SOCIETY'S VISIT TO WEM

by Stewart Pyper

On Sunday, September 19th last year members of the Society and their guests visited the collection of birds and mammals belonging to Will Harrison and his wife Libby. Will, who has been a member of the Society for many years, with his wife, maintains a large collection of birds ranging from small passerines such as tanagers up to rheas. About 40 members and their guests accepted the invitation and the collection was viewed during overcast weather, with the sun eventually breaking through after a quite horrendous morning of incessant rain.

There is a tropical house in which viewing the birds was at times difficult due to the luxurious plant life, however, we managed to see tanagers, zosterops, Roulroul Partridges and Golden Heart Doves. Within the traditional walled garden, Chilean Flamingos and Demoiselle Cranes live at liberty. The aviaries around the inside of the wall are spacious and well planted, except those in which certain pheasants such as Monals are housed. Here, we also saw White-cheeked Touracos and Red-winged Starlings both of which had bred during 1999, also Violaceous Touracos. We also saw laughing thrushes, Satyr and Temminck's Tragopans, Edwards' and Argus Pheasants as well as species such as Black-necked Stilts.

A small temperate greenhouse houses Fairy Bluebirds, Emerald Starlings and Luzon Bleeding Heart Doves, here again the vegetation was ideal for the birds but not for viewing them. The emphasis is on breeding whenever possible and with this in mind, the aviaries are not overstocked. Wonga Pigeons were seen, also a breeding pair of Red-legged Seriema with their youngsters. Snowy Owls which had bred in 1999 were seen, as were Stanley Cranes and Sclater's Curassows.

There is quite a large collection of waterfowl amongst which are Red-breasted Geese and a very aggressive pair of Cereopsis Geese, also White-winged Wood Ducks. The latter, on loan from the Wildfowl and Wetlands Trust, are regular breeders. This year, eight out of nine eggs hatched and six of the young went to the trust's new Wetland Centre at Barn Elms, west London.

A large paddock in front of the house has recently been enclosed with fox-proof fencing and it is Will's intention to develop this area. We also saw a selection of mammals, including Llamas, Red Squirrels, Malaysian Prevost's Squirrels, Maras, Parma and Bennett's Wallabies, and Capybaras.

Our hosts very kindly provided tea after our tour of the collection, and the Society thanked them for their kindness in inviting us to view their varied collection.

COUNCIL MEETING

A Council Meeting was held Sunday, 12th March 2000 at Wargrave, Berkshire.

The following members were present: Miss R. M. Ezra (President), R. C. J. Sawyer (Vice President), K. J. Lawrence (Chairman), M. Ellis (Hon. Editor), Mrs L. Gardner, R. E. Oxley, S. Pyper, J. Trollope, Ms R. Wiseman.

The Hon. Editor reported that the next magazine (No.1, 2000) would be sent out shortly, and that he had enough material for the following magazine (this issue). Material is needed, however, for future issues. The Hon. Editor said that he is thinking of using a colour photo of the Bali Starling for the front cover of the magazine, if he can find a high quality one which is suitable for the purpose. The cost of publishing the magazine this year is likely to remain unchanged and there will again be approximately 12 colour photos. The Society has now purchased a fax machine for the Hon. Editor. The number is:- +44 (0)1208 812260. He would prefer that it is used for short communications only, and that full articles continue to be sent by post.

It was decided that the D. H. S. Risdon Award for the best article in the magazine during the previous year should go to Greg Bockheim and Shannon Mezzell for The Black Crake *Amaurornis flavirostris* an Effective Cooperative Breeder at Disney's Animal Kingdom, Florida, USA (*Avicultural Magazine* 105, 1:12-21). Eric Callaghan was awarded the Society's medal for the first breeding of the Bearded Barbet *Lybius dubius* in Great Britain and Ireland.

The Hon. Secretary/Treasurer missed the meeting due to illness, however, Council Members were of the opinion that the Society is in a sound position financially. This was confirmed later when the account for 1999 was circulated to Council Members.

Since the subjects were discussed at the Council Meeting, Avicultural Society Vice Presidents, C. J. S. Marler and R. C. J. Sawyer, were among the speakers at Avian 2000, which was supported by the Society, our website (www.avisoc.co.uk) is up and running and the Society had a stand at The Festival of Birds held Sunday, May 14th, at Shepton Mallet, and at Exotics Quest 2000 held Sunday, May 21st, at Bristol Vet School.

The President's Garden Party will be held Sunday, July 16th, and the Autumn Social Meeting, Sunday, September 17th at Twycross Zoo, Leicestershire, followed after lunch there by a visit to Andrew and Audrey Perkins' collection at Netherseal, Nr. Swadlincote, Derbyshire.

NEWS & VIEWS

THE SOCIETY"S WEBSITE

The Society has now got a website - http://www.avisoc.co.uk -which we hope you will visit and encourage others to visit too, who may be interested in joining the Society.

As well as information about the Avicultural Society, the contents of the current issue of the magazine, notes for authors and details of how to join the Society, there is also a list of the contents of recent back issues. Eventually we hope to list the contents of all the back issues we still have in stock, however, this is likely to take a little time. We are keen to sell as many back issues as we can, both to realise the money and because they take up so much storage space. They are a fantastic source of information and cost just £3 (roughly US$4.50) each, including post & packing.

There is also a 'bulletin board' on the site, on which you are invited to post items of interest to others. We have already received postings from the USA, Canada and elsewhere. It is an especially quick way to promulgate news of developments, such as your latest breeding results.

I would like include a 'swap shop-cum-marriage bureau' (for birds) - called the 'nest site' perhaps - where members can list birds they require to make-up breeding pairs and/or surplus birds others may be looking for to make-up breeding pairs of their own. All arrangements for any such swaps and matters arising from these will have to remain the responsibility of the participants.

The website was designed by Richard Reeves, who would value your comments. His e-mail address is: reeves@astronode.co.uk. The Society hopes to shortly set-up its own direct e-mail link with members. It is also considering accepting advertisements for inclusion on the website.

The Society reserves the right to remove any material posted on the website that is considered unsuitable for whatever reason.

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HIGHLY RESPECTED AUTHOR

Derek Goodwin, the highly respected author of *Pigeons and Doves of the World* and *Estrildid finches of the world*, as well as numerous articles in the *Avicultural Magazine* and other journals, had his 80th birthday earlier this year and was recently elected an Hon. Life Member of the Avicultural Society.

JAILED FOR TWO AND A HALF YEARS

At Newcastle Crown Court on April 14th, Harry Sissens was found guilty of illegally importing into the UK three Lear's Macaws *Anodorhynchus leari* and six Blue-headed Macaws *Ara couloni*. He was jailed for two and a half years. He was also charged with illegally selling a Palm Cockatoo *Probosciger aterrimus* and Hyacinth Macaws *A. hyacinthinus*, but cleared of those charges on the orders of the judge. Harry Sissens was arrested after Customs & Excise officers raided his property in north Yorkshire, in April 1998, and seized more than 140 birds, including the nine macaws. He was alleged to have bought birds on a number of trips to Yugoslavia and Slovakia and smuggled them into the UK.

It was reported later that Harry Sissens planned to appeal against the sentence, and that the Brazilian government has asked for the return of the Lear's Macaws, and the hope is that they will become part of a controlled breeding programme.

It was also reported, though less widely, that by November last year, 16 of the birds seized had died. This was reported to include a Red-vented Cockatoo *Cacatua haematuropygia*, a Palm Cockatoo *P. a. goliathia*, Yellow-tailed Black Cockatoo *Calytorhynchus funereus*, a Blue-headed Macaw, two Blue-throated Macaws *A. glaucogularis*, two Red-fronted Macaws *A. rubrogenys*, a Hyacinth Macaw and a Thick-billed Parrot *Rhynchopsitta pachyrhyncha*.

* * *

FALCON GROUP

Dr Tom Bailey, who with Susan Anderson, wrote about Commonly Encountered Hatching and Post-hatching Problems in Bustards (*Avicultural Magazine* 105,3:114-126), has sent a copy of *Falco* The Newsletter of the Middle East Falcon Research Group, which he co-edits with Dr Nigel Barton. Issue No.15, January 2000, includes items about a new falcon hospital opened by the National Avian Research Center in Abu Dhabi, trichinellosis in raptors in the United Arab Emirates, veterinary aspects of a new falcon release project, and falcon sales in Quatar.

The Middle East Falcon Research Group (PO. Box 45553, Abu Dhabi, UAE) has also published *Microchips and their use in Monitoring Movements of Sakers and Peregrines in Asia and the Middle East,* and is planning to produce a short video of this microchipping scheme which will be distributed to government departments in the exporting countries, CITES, IUCN, TRAFFIC, environmental agencies in the countries of export and falcon hospitals in the Middle East.

ISLANDS OF HOPE

On the Indonesian island of Seram, Project Bird Watch is helping bird trappers find alternative means of income that will eliminate their dependence on the trade in Moluccan Cockatoos *Cacatua moluccensis* and other wild birds. A canopy platform has been built in Manusela National Park and former bird trappers work there as guides, and admission fees go into a local community development fund. To learn more about this, you can write to Project Bird Watch, c/o Jeannie White, 345 Culver Blvd., Playa del Rey, CA 90293, USA, or visit its website at www.tpp.org/pbw.

Described in *Wildlife Conservation,* April 2000, as 'the first new national park of the new millennium', Morne Diablotin National Park on the Caribbean island of Dominica, straddles the highest volcanic peak in the Caribbean and will offer protection to two rare species, the Imperial Amazon *Amazona imperialis*, of which fewer than 200 survive in the wild, and the Red-necked Amazon *A. arausiaca.* The 10,000 acres (approx.4,000 hectares) national park will afford protection to about 160 species of birds in all and 55 species of butterflies. If you would like to know more, you can write to the Rare Species Conservatory Foundation, PO. Box 1371, Loxahatchee, Florida 33470, USA, or visit its website at www.rarespecies.org.

You can also learn more about these two rare Amazons by reading Paul R. Reillo's article about them in the latest issue of *PsittaScene*, Vol.12, No.l, 2000. In the same issue, the Editor, Rosemary Low, writes about the discovery in Colombia of a third flock of 20 Yellow-eared Parrots or Conures *Ognorhynchus icterotis*. This has brought the total of known individuals to 82 birds. Elsewhere in the same issue, Rosemary attacks the New Zealand Department of Conservation's decision to attempt to eradicate by trapping and killing (by breaking their necks or lethal injections), and by poisoning and shooting, the feral population of Rainbow Lorikeets *Trichoglossus haematodus moluccanus* that has become established in the Auckland area. For those who do not know, *PsittaScene* is the magazine of the World Parrot Trust, Glanmor House, Hayle, Cornwall TR27 4HP, England.

* * *

VICE PRESIDENT RETIRES

Avicultural Society Vice President, Christopher Marler, has closed Flamingo Gardens and Zoological Park to the public after 42 years. He has sold many of the birds, keeping only about 100, including flamingos, pelicans, Bald Eagles *Haliaeetus leucocephalus* and lutino Ring-necked Parrakeets *Psittacula krameri*. Christopher has also retained a 40-strong herd of white Fallow Deer, his white wallabies and a pair of American Bison. He will continue to be a Vice President of the Avicultural Society.

WATERFOWL SALE

Bill Makins has put 220 acre (approx. 90 hectare) Pensthorpe Waterfowl Park and Nature Reserve up for sale. The park, opened in 1988, has more than 120 species of ducks, geese, swans and other waterbirds. The collection includes King Eiders *Somateria spectabilis*, Harlequin Ducks *Histrionicus histrionicus*, African Pygmy Geese *Netta auritus* and Red-breasted Geese *Branta ruficollis*. Offers of more than £2.6 million (approx.US$4.1 million) are being sought for the estate near Fakenham, four miles (6.4km) from the north Norfolk coast, which as well as the waterfowl park and nature reserve, includes meadows, lakes, woodland and farmland with four sites of scientific interest, Pensthorpe Hall and three cottages.

* * *

LOST BIRDS REDISCOVERED

In a recent issue of *The Shield* magazine, members of five expeditions reported on their experiences participating in the BP Conservation Programme, a joint initiative between BP Amoco, BirdLife International and Fauna & Flora International. Jon Riley described how after searching for six months, Action Sampiri rediscovered the Caerulean Paradise-Flycatcher *Eutrichomyias rowleyi*, over 120 years after it was last seen on the tiny Indonesian island of Sangihe, between Sulawesi and the Philippines. Julia Jones described Project Diadema's expedition to New Caledonia, home of the Kagu *Rhynochetos jubatus*, where members of the expedition rediscovered the Owlet Nightjar *Aegotheles savesi*, which had not been seen since it was discovered at the end of the nineteenth century.

* * *

SIR PETER SCOTT'S LEGACY

On the site of some redundant Victorian reservoirs beside the River Thames in west London, on May 26th, The Wildfowl and Wetlands Trust opened The Wetland Centre (website www.wwt.org.uk). Easily reached from central London by public transport, it has a collection of captive waterfowl, including Madagascar Teal *Anas bernieri,* New Zealand Blue Duck *Hymenolaimus malacorhynchos* and Hawaiian Goose or Nene *Branta sandvicensis*, and attracts wild species such as Shoveler *A. clypeata*, Pochard *Aythya ferina*, Canada Goose *B. canadensis*, Lapwing *Vanellus vanellus*, Kingfisher *Alcedo atthis*, Little Egret *Egretta garzetta*, and even Spoonbill *Platalea leucorodia* and Ortolan Bunting *Emberiza hortulana*.

STEPPING DOWN

Mike Reynolds, founder and Hon. Director of the World Parrot Trust, is to stand down at the end of this year. Mike will be 70 in February next year, and after more than a decade in charge, wants to make way for a new Director. He has already handed over the running of Paradise Park, at Hayle, Cornwall, to his son Nick and daugther Alison.

* * *

BACK AT THE SHOW

The Society again had a stand at the National Exhibition of Cage & Aviary Birds, held last December at the Telford International Centre. It enables Officers of the Society to meet members both old and new, and to publicise the Society. The stand, managed by Council Member Mike Curzon, a Director of the Tropical Bird Gardens at Rode, Somerset, was somewhat 'tucked away' this time and as a result we were not as successful in enrolling new members as in previous years.

The sunbird class was judged by Raymond Sawyer, who gave the first prize to Mr & Mrs A. Tugman's male Amethyst Sunbird *Nectarinia amethystina*. This bird went on to be judged best nectar feeder, best foreign bird and best bird in show, winning the Sir Richard Haddon Trophy.

This year's show is returning to the NEC in Birmingham on the weekend of December 2nd-3rd. At the time of writing, it is yet to be confirmed whether the Society will be offered a stand at the show. If as we hope, we are, will anyone willing to help run it contact Stewart Pyper at the address given on the inside of the front cover of this magazine, or by telephoning him on 01373 836293.

* * *

PRIVATE EYE

If you would like to keep a closer watch on what is (or is not) happening in your nest-boxes and/or aviaries, PRO-CAM Ltd., John St. Works, Brierfield, Nelson, Lancs. BB9 5NX (Tel:01282 697779/Fax:01282 698677/ E-mail:john@procamltd.com/website:www.procamltd.com), can supply waterproof and dustproof, infra-red cameras specially designed for placing in nest-boxes, as well as a comprehensive range other equipment suitable for observation and security purposes.

* * *

CURL-CRESTED ARACARI BRED

The *Zoological Society of San Diego, 1999 Physical Inventory*, has on the front cover a colour photo of a Curl-crested Aracari *Pteroglossus beauharnaesii* nestling hatched at San Diego last year. Other species hatched there during 1999 included a Harpy Eagle *Harpia harpyja*, a Crowned Eagle *Stephanoaetus coronatus*, a White-faced Pigeon *Turacoena manadensis*, a Western Green-naped Pheasant Pigeon *Otidiphaps nobilis nobilis*, two Superb Birds of Paradise *Lophorina superba feminina* and 10 Empress of Germany's Birds of Paradise *Paradisaea raggiana augustaevictoria*.

* * *

SOUTH AFRICAN PARRAKEETS

The latest *Newsletter* of BirdLife South Africa, Vol.2, No.1, 2000, includes references to several sightings of Ring-necked or Rose-ringed Parrakeets *Psittacula krameri*. While Ron Searle describes passing a pair of large parrakeets perched on telephone wires when driving north of Midrand, and reversing to confirm that they were Ring-necked Parrakeets (which have colonised the northern suburbs of Greater Johannesburg, but have not yet been recorded in the Midrand area), only to discover that the birds were a pair of Patagonian Conures or Burrowing Parrakeets *Cyanoliseus patagonus*. You can visit the BirdLife South Africa website at http://www.birdlife.org.za.

* * *

A POSSIBLE EXPLANATION

A possible explanation as to the origin of the two parrakeets perched on the telephone wires mentioned in the previous item (above), may have come recently in another news item published elsewhere about the opening of Lory Park, described as: 'a new zoo dedicated to parrots and other birds, located in Midrand.' It is claimed to be the largest bird zoo in Africa, and a sanctuary and breeding centre for parrots, including macaws, Amazons, cockatoos, lories and African species. It also aims to be an educational venue for school children, the general public and bird enthusiasts.

* * *

DONATIONS RECEIVED IN 1999

The Society is most grateful to the following members for their generous support:

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DULCIE COOKE AWARD

Ken Ashken, the son of the late Dulcie Cooke, who was an enthusiastic supporter of the Society and attended many social events and wrote for the magazine, and whose Obituary was published in Vol.104, No.3, pp.143-144, has generously given the Society a sum of money to create the Dulcie Cooke Award in his late mother's memory. The Council has decided that this award, in the form of an engraved plaque, will be awarded annually for what in the Council's opinion is the best photo submitted to illustrate an article in the magazine.

Mrs June Bailey has donated to the Avicultural Society on behalf of the late Dulcinea Rogers, also known as Mrs Dulcie Cooke, and on behalf of the late Mr Freddie Cooke, the royalties from their books about bird keeping which were given to her.

The Society thanks Mrs J. Bailey and Mr K. R. Ashken for their generosity.

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For our price list or if you just want some advice please contact Rob Harvey (ex-owner & curator of Birdworld for over 20 years)

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Published by the Avicultural Society, England.
Produced by DATA PUBLISHING SERVICE, *Cheddar.*
